REMARKS

This Response responds to the Office Action dated March 3, 2006 in which the Examiner rejected claims 1-3, 5-16 and 18-24 under 35 U.S.C. §103.

Claim 1 claims a stator core, claim 9 claims a core back and claim 16 claims a method for producing a stator core. The stator core comprises a core back and a plurality of teeth. The plurality of teeth are arranged circumferentially on the core back and extend radially therefrom. The core back is at least one sheet of electrically insulated soft magnetic material arranged as a spiral. The core back includes openings, each associated with a tooth. A portion of each tooth is inserted into an associated opening.

Through the structure and method of the claimed invention having a core back including openings and having a portion of each tooth inserted into an associated opening as claimed in claims 1, 9 and 16, the claimed invention provides a stator core, core back and method of producing a stator core which improves the magnetic flux which will flow from each turn of the spiral core to a tooth. The prior art does not show, teach or suggest the invention as claimed in claims 1, 9 and 16.

Claims 1-3, 5-16 and 18-24 were rejected under 35 U.S.C. §103 as being unpatentable over *Rosenberry, Jr.* (U.S. Patent 4,392,073) in view of *Jack et al.* (U.S. Patent 6,472,792).

Applicant respectfully traverses the Examiner's rejection of the claims under 35 U.S.C. §103. The claims have been reviewed in light of the Office Action, and for reasons which will be set forth below, Applicant respectfully requests the Examiner withdraws the rejection to the claims and allows the claims to issue.

Rosenberry, Jr. appears to disclosure an amorphous metal stator structure including concentric cylinders formed of spirally or helically wound ribbon that is arranged to facilitate the mounting of one of the stator cylindrical components within the other. (Column 1, lines 10-14). As the term amorphous metal is used herein it is meant to describe metals and metal alloys as well as metallic glass compositions that are formed by rapidly cooling from a molten state to a solid state so that there is no significant crystalline structure existing in the solidified state. (Column 1, lines 19-24). The properties of amorphous metal ribbons that make them particularly attractive for use in the manufacture of dynamoelectric machine stators is that such ribbons are mechanically strong and ductile and can be manufactured at relatively low cost compared with grain-oriented silicon steels of the types now commonly used to make such stators. (Column 2, lines 28-34). In FIG. 1 the portion of stator assembly 1 shown is spaced radially outward from a rotor 2 that is mounted on a rotatable shaft 3 in any suitable conventional manner, such as by being keyed thereto. If desired, the stator assembly 1 may be housed in a conventional ferrous metal housing (not shown) or in any other conventional manner. The stator 1 comprises a first cylinder 4 that is mounted in low magnetic reluctance relationship concentrically with a second cylinder 5. The desired optimumly low reluctance relationship is attained between the two cylinders 4 and 5 by causing the inner diameter of the cylinder 4 to fit within a close dimension tolerance with the outer diameter of the second cylinder 5. (Column 5, lines 48-62). In FIGS. 1 and 2, the first cylinder 4 is formed of an edgewound helix of amorphous metal ribbon that is arranged with its adjacent turns stacked on one another to form the cylinder. (Column 5, line 65 to column 6, line 2). As shown in FIG. 2, the respective helical

turns forming the first cylinder 4 lie in planes that are substantially perpendicular to the longitudinal axis of the cylinder. On the other hand, each of the turns of a second helically wound cylinder 5 of amorphous metal ribbon is conical in configuration, as best seen in FIG. 2 of the drawing. (Column 6, lines 18-24). To enable energizing windings to be supported in operating relationship on the stator 1, the second cylinder 5 is provided with a plurality of axially extending winding slots 6, 6A, 6B, etc. which may be formed therein in any suitable manner. For example, the slots may be cast directly into the amorphous metal ribbon forming the cylinder 5 at the time the ribbon is originally solidified. (Column 6, lines 38-45). In FIG. 6 there is shown a rotatably mounted disc 8 supported on a shaft 9 that is selectively rotated by appropriate drive means (not shown). (Column 9, lines 15-17). A suitable reservoir 12 is provided for maintaining a selected amorphous metal alloy in a molten condition while it is being discharged through a shaped port 12' onto the upper surface of the disc 8 in a pattern that is substantially the width of the maximum portion of the pattern defined between the two lines 10 and 11. A second rotatable disc 13 is positioned to one side of the disc 8 for storing the ribbon 14 as it is solidified and thrown off of the disc 8 by the rapid rotation thereof. (Column 9, lines 33-42).

Thus, *Rosenberry, Jr.* merely discloses a) a first cylinder 4 formed of an edge wound helix of amorphous metal ribbon and b) a second cylinder 5 formed inside the cylinder 4 and provided with a plurality of axially extending winding slots 6, 6A, 6B, etc. Nothing in *Rosenberry, Jr.* shows, teaches or suggests a core back including openings, each associated with a tooth as claimed in claims 1, 9 and 16. Rather, *Rosenberry, Jr.* merely discloses cylinders 4 and 5 without any openings.

Additionally, *Rosenberry, Jr.* merely discloses a cylinder 5 having a plurality of axially extending winding slots 6, 6A, 6B, etc. Thus, nothing in *Rosenberry, Jr.* shows, teaches or suggests a portion of each tooth is inserted into an associated opening in a core back as claimed in claims 1, 9 and 16. Rather, *Rosenberry, Jr.* teaches away from the claimed invention since the cylinder 5 is provided with the axially extending winding slots.

Finally, *Rosenberry, Jr.* merely discloses each cylinder 4 and 5 is made of amorphous metal formed into metal ribbons. Nothing in *Rosenberry, Jr.* shows, teaches or suggests a core back is at least one sheet of electrically insulated soft magnetic material as claimed in claims 1, 9 and 16. Rather, *Rosenberry, Jr.* merely discloses winding a metal ribbon of amorphous metal.

Jack et al. appear to disclose a stator tooth 1 illustrated in FIGS. 1 and 3-6 has a stem 2 of constant cross-sectional area and a distal tip 3 of larger cross-sectional area than the stem 2. Preferably, the tooth 1 is made by compressing a soft magnetic powder material, such as Somaloy 500 made by Hoganas AB of Sweden. The stator tooth 1 has a proximal end portion 4 of the same cross-sectional area as (or less cross-sectional area than) the stem 2. A stator core-back section 5 illustrated in FIGS. 1, 2, 5 and 6 is of conventional shape except for a radial through-hole 6 having the same cross-sectional area as the proximal end portion 4 of the tooth 1 in FIGS. 1 and 3-6. The core-back section 5 may be made of the same material as the tooth 1, the surface of the hole 6 as well as the dimensions thereof being such as to enable a close fit with the proximal end portion 4 of the tooth 1 (col. 2, lines 31-46). In assembling a single stator section, the coil 7 is first slid on to the stem 2 of the tooth 1 from the proximal end portion 4 towards the distal tip 3. In order

that this should be possible without any substantial gap existing between the coil 7 and the tooth 1 in the assembled state, stem 2 should have non-decreasing cross-sectional dimensions, i.e. substantially constant or increasing cross-sectional dimensions, from the proximal end portion 4 to the distal tip 3, i.e. along a length of the tooth corresponding to a winding slot. Also, the shape of the central hole of the coil 7 should correspond to the shape of the stem 2 (col. 2, lines 55-65).

Thus, *Jack et al.* merely discloses assembling nine stator sections to form a complete stator core (column 2, lines 50-54). Nothing in *Jack et al.* shows, teaches or suggests a core back of at least one sheet of electrically insulated soft magnetic material arranged in a spiral as claimed in claims 1, 9 and 16. Rather, *Jack et al.* teaches away from the claimed invention and forms the stator core from a plurality of sections.

Additionally, *Jack et al.* merely discloses force fitting a tooth 1 into a stator core back section 5. Nothing in *Jack et al.* shows, teaches or suggests inserting a portion of a tooth into an associated opening in the spirally wound core back as claimed in claims 1, 9 and 16. Rather, *Jack et al.* merely discloses teeth that are force fitted into one section of a core back.

The combination of *Rosenberry, Jr.* and *Jack et al.* would not be possible. In particular, *Rosenberry, Jr.* is directed to first and second helically wound cylinders arranged concentric with each other and provided with teeth on the inner cylinder. Furthermore, *Rosenberry, Jr.* is manufactured from amorphous metals. *Jack et al.* has a core consisting of a plurality of core back sections which are assembled together. The teeth of *Jack et al.* are formed of soft magnetic powders and thus have a crystalline structure (i.e., not amorphous). *Rosenberry, Jr.* has integrally

formed teeth formed on the internal surface of cylinder 5 while *Jack et al.* has separate teeth. The type of metal used in *Rosenberry, Jr.* is amorphous, whereas *Jack et al.* is crystalline. *Jack et al.* has no wound core back, while *Rosenberry, Jr.* has no separately mounted teeth. Nothing in *Rosenberry, Jr.* or *Jack et al.* show, teach or suggest why these two technically different references would be combined. Applicant therefore respectfully submits that a person of ordinary skill in the art would not modify *Rosenberry, Jr.* with *Jack et al.* nor would they substitute the amorphous metal for the crystalline teeth of *Jack et al.* Therefore, Applicant respectfully submits that the combination of the references is not possible. Applicant therefore respectfully requests the Examiner withdraws the rejection to claims 1, 9 and 16 under 35 U.S.C. §103.

Claims 2-3, 5-8, 10-15 and 18-24 depend from claims 1, 9 and 16 and recited additional features. Applicant respectfully submits that claims 2-3, 5-8, 10-15 and 18-24 would not have been obvious within the meaning of 35 U.S.C. §103 over *Rosenberry, Jr.* and *Jack et al.* at least for the reasons as set forth above. Therefore, Applicant respectfully requests the Examiner withdraws the rejection to claims 2-3, 5-8, 10-15 and 18-24 under 35 U.S.C. §103.

The prior art of record, which is not relied upon, is acknowledged. The references taken singularly or in combination do not anticipate of make obvious the claimed invention.

Thus it now appears that the application is in condition for reconsideration and allowance. Reconsideration and allowance at an early date are respectfully requested.

If for any reason the Examiner feels that the application is not now in condition for allowance, the Examiner is respectfully requested to contact, by telephone, the Applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed within the currently set shortened statutory period, Applicant respectfully petitions for an appropriate extension of time. The fees for such extension of time may be charged to our Deposit Account No. 02-4800.

In the event that any additional fees are due with this paper, please charge our Deposit Account No. 02-4800.

Respectfully submitted,

BUCHANAN INGERSOLL PC

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